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File Code: 3420 **Date:** October 21, 2006
Route To:

Subject: Proposed Forest Health projects on the North Kaibab RD

To: District Ranger, North Kaibab RD, Kaibab NF

On September 7 and 8, 2006, I visited the North Kaibab RD, Kaibab NF, at the request of Steve Boyer to evaluate potential forest health projects on the District. Steve and I visited the proposed Little Mountain, West Lake, and Big Saddle Forest Health Project areas. I describe in this report current forest stand conditions and what bark beetle activity was observed in these areas and make recommendations to minimize future bark beetle impacts.

Little Mountain Forest Health Project

The North Kaibab RD is proposing to pre-commercially thin 98 acres of ponderosa pine forest in 2007 within the Little Mountain project area located approximately 30 miles south of the Fredonia, Arizona. The primary objectives for this thinning are to improve forest health conditions by increasing forest resilience to insects and diseases, reducing fire hazard potential and promoting development of northern goshawks habitat.

Proposed treatments include pre-commercial thinning of ponderosa pine less than 9 inches in diameter and to remove ponderosa pine < 9 inches DBH 12-40 feet from large overstory trees. The resulting stand structure created would have scattered groups of small diameter pine trees with approximately 180 trees per acre in goshawk foraging habitats (FAs) and 240 trees per acre in goshawk nesting areas (PFAs) and large overstory trees with reduced inter-tree competition from small trees below the crown drip-line. Thinning slash would be hand piled and burned at a later date. The proposed pre-commercial thinning along with associated activity slash treatments would reduce the Fire Regime Condition Class for the treated sites from a Condition Class 3 to a Condition Class 2.

Steve and I conducted a walk through survey of the proposed thinning area to observe bark beetle activity and general stand conditions. These stands are currently experiencing low to moderate bark beetle activity (***Figure 1***). Currently- and previously-infested pines were observed to have been attacked by both western pine beetle (*Dendroctonus brevicomis*) and roundheaded pine beetle (*D. adjunctus*). The stands to be thinned are within the ponderosa pine/Arizona fescue plant association consisting of high density thickets of small diameter ponderosa pine exceeding 2,000 trees per acre intermixed with residual large overstory ponderosa pine trees (***Figure 1***). The current tree stocking levels are many times greater than pre-Euro American settlement stocking levels. A few sites proposed for thinning in the Little Mountain project area also have pockets of dwarf mistletoe infection in ponderosa pine.

Figure 1. *Forest stand conditions (left) and bark beetle activity (right) present within the proposed Little Mountain Forest Health project area.*

West Lake Forest Health Project

The North Kaibab RD is proposing to pre-commercially thin 282 acres of ponderosa pine forest in 2007 within the West Lake Forest Health project area located approximately 30 miles south of the Fredonia, Arizona. The proposed thinning treatments would be completed within a larger 1,128 acre project area. The primary objectives for this thinning are to improve forest health conditions by increasing forest resilience to insects and diseases, reducing fire hazard potential and promoting development of northern goshawks habitat.

Proposed treatments include pre-commercial thinning of ponderosa pine less than 9 inches in diameter and to remove ponderosa pine < 9 inches DBH 12-40 feet from large overstory trees. The resulting stand structure created would have scattered groups of small diameter pine trees with approximately 180 trees per acre in goshawk foraging habitats (FAs) and 240 trees per acre in goshawk nesting areas (PFAs) and large overstory trees with reduced inter-tree competition from small trees below the crown dripline. Thinning slash would be hand piled and burned at a later date. The proposed pre-commercial thinning along with associated activity slash treatments would reduce the Fire Regime Condition Class for the treated sites from a Condition Class 3 to a Condition Class 2.

Steve and I conducted a walk through survey of the proposed thinning to observe bark beetle activity and general stand conditions. Similar to the Little Mountain project area, forested stands in West Lake are currently experiencing low to moderate bark beetle activity. Currently- and previously-infested pines were observed to have been attacked by pine engraver beetles (*Ips pini*), western pine beetle, and roundheaded pine beetle. The stands to be thinned are within the ponderosa pine/Arizona fescue plant association consisting of high density thickets of small diameter ponderosa pine exceeding 2,000 trees per acre intermixed with residual large overstory ponderosa pine trees. The current tree stocking levels are many times greater than pre-Euro

American settlement stocking levels. A few stands proposed for thinning in the West Lake project area also have pockets of ponderosa pine infected with dwarf mistletoe.

Big Saddle Forest Health Project

The North Kaibab RD is proposing to pre-commercially thin 50 acres of ponderosa pine forest in 2007 within the Big Saddle project area located approximately 35 miles south of the Fredonia, Arizona. The proposed thinning treatments would be completed within a larger 565 acre project area. The primary objectives for this thinning are to improve forest health conditions by increasing forest resilience to insects and diseases, reducing fire hazard potential and promoting development of northern goshawks habitat.

Proposed treatments include pre-commercial thinning of ponderosa pine less than 9 inches in diameter and to remove ponderosa pine < 9 inches DBH 12-40 feet from large overstory trees. The resulting stand structure created would have scattered groups of small diameter pine trees with approximately 180 trees per acre in goshawk foraging habitats (FAs) and 240 trees per acre in goshawk nesting areas (PFAs) and large overstory trees with reduced inter-tree competition from small trees below the crown dripline. Thinning slash would be hand piled and burned at a later date. The proposed pre-commercial thinning along with associated activity slash treatments would reduce the Fire Regime Condition Class for the treated sites from a Condition Class 3 to a Condition Class 2.

Steve and I conducted a walk through survey of the proposed thinning to observe bark beetle activity and general stand conditions. These are currently experiencing low to moderate bark beetle activity. Currently- and previously-infested pines were observed to have been attacked by both western pine beetle and roundheaded pine beetle. The stands to be thinned within Big Saddle are within the ponderosa pine/Gamble oak plant association consisting of high density thickets of small diameter ponderosa pine exceeding 2,000 trees per acre intermixed with residual large overstory ponderosa pine trees. The current tree stocking levels are many times greater than pre-Euro American settlement stocking levels. A few sites proposed for thinning in the Little Mountain project area also have pockets of dwarf mistletoe infection in ponderosa pine.

Recommendations

All three project areas that are being proposed for non-commercial thinning treatments will help to reduce the overall susceptibility of stands to bark beetle attack in the long term as well as improve overall tree vigor, lessen risk of catastrophic wildfire, improve vegetative species diversity, and promote development of northern goshawk habitat. If limited funding is available, I recommend that priority be given to the Little Mountain project first and Big Saddle second as they are of manageable size to be completed in FY07. Both Little Mountain and West Lake have NEPA documentation, Category 6 Categorical Exclusion that was signed at the end of September. NEPA documentation for Big Saddle is currently in the Notice and Comment Period and a Categorical Exclusion is expected to be signed at the end of November.

High stand density reduces both individual tree and stand vigor which increases stand susceptibility to mortality from bark beetles. Over the past several years the Kaibab National Forest has seen an epidemic build-up of bark beetle populations with a large amount of associated mortality in ponderosa pine. Excess competition from smaller trees has also greatly

increased the risk of loss due to mortality of the scattered large yellow pine and large oak in the area. Continuous interlocking crowns and well-developed fuel ladders leaves vegetation on these sites at a high risk of loss from catastrophic wildfire.

Thinning from below has been experimentally demonstrated to increase the resistance level of the residual mature pine overstory (Feeney, et al., 1998). Thinning slash may pose a short-term risk to residual trees in the thinning units or surrounding areas depending on the timing of thinning, local population of pine engraver beetles, and site and environmental factors such as site quality and precipitation. Careful monitoring of beetle populations associated with these thinning projects should be implemented. Parker (1991) provides guidelines for minimizing pine engraver beetle impacts associated with thinning treatments.

Prevention funds may be available for FY 2007 from Forest Health Protection to implement projects related to bark beetle and dwarf mistletoe activity in these projects sites. Requests for these funds should be submitted no later than October 13, 2006.

If you have any questions regarding my assessment or my recommendations, please let me know.

/s/ Joel D. McMillin
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References Cited

Feeney, S.R., T.E. Kolb, M.R. Wagner, and W.W. Covington. 1998. Influence of thinning and burning restoration treatments on pre-settlement ponderosa pines at the Gus Pearson Natural Area. Canadian Journal of Forest Research 28: 1295-1306.

Parker, D.L. 1991. Integrated pest management guide: Arizona five-spined Ips, *Ips lecontei* Swaine, and Pine engraver, *Ips pini* (Say), in ponderosa pine. USDA Forest Service, Southwestern Region, R-3, 91-8. 17 p.